ART 34 AMDT

English translation of the amended sheets of International Preliminary Examination Report.

CLAIMS

1. Process for manufacturing a neutron absorbent material, said material being a composite material containing boron carbide and hafnium, comprising the following steps:

- adding hafnium power to a powder of boron carbide,
- mixing the boron carbide powder and the hafnium powder such as to obtain a homogeneous mixture, and
- sintering the homogeneous mixture at sufficient sintering pressure and temperature to obtain a composite material,

characterized in that the sintering pressure is applied before the temperature of the homogeneous mixture of the powders reaches the sinter reaction temperature of said mixture.

2. Process according to claim 1, in which up to approximately 40% by volume of hafnium is added, the homogeneous mixture of the boron carbide and hafnium powders representing 100% by volume.

3. Process according to claim 1, in which approximately 25% by volume of hafnium is added, the homogeneous mixture of the boron carbide and hafnium powders representing 100% by volume.

4. Process according to any of claims 1 to 3, in which the grain size of the boron carbide powder ranges up to approximately 50 µm.

5. Process according to any of claims 1 to 4, in which the grain size of the hafnium powder ranges up to approximately 20 µm.

6. Process according to any of claims 1 to 4, in which the grain size of the hafnium powder ranges up to approximately 10 µm.

7. Process according to claim 1, in which the mixture of boron carbide and hafnium powders is made by applying ultrasound to a paste containing said powders dispersed in a dispersion liquid.

8. Process according to claim 1, in which the homogeneous mixture is sintered in a vacuum or in an atmosphere formed of a neutral gas.

9. Process according to claim 1 or 6, in which the homogeneous mixture is sintered in a graphite mould lined with a graphite sheet.

10. Process according to any of the preceding claims, in which the mixture is sintered at a temperature of approximately 1800°C to 2100°C, at a pressure of around 70 to 110MPa for a period of approximately 15 to 90 minutes.

11. Process according to any of the preceding claims, in which the mixture is sintered at a

temperature of approximately 2000°C, at a pressure of around 92 MPa for a period of approximately 1 hour.

12. Neutron absorbent material containing boron carbide and hafnium diboride obtained using a process according to any of claims 1 to 11.